TOXICON

An interdisciplinary journal on the toxins
from animals, plants and microorganisms

Editor: Alan L. Harvey

Volume 32, 1994

Pergamon

TOXICON

An Interdisciplinary Journal on the Toxins Derived from Animals, Plants and Microorganisms.
Official Journal of the International Society on Toxinology.

Editor-in-Chief

Prof. ALAN L. HARVEY, Dept of Physiology and Pharmacology, University of Strathclyde, Royal College, 204 George Street, Glasgow G1 1XW, U.K.

Receiving Editor, North America

Prof. VINCENT A. CHIAPPINELLI, Dept of Pharmacological and Physiological Science, St Louis University School of Medicine, 1402 South Grand Blvd, St Louis, MO 63104, U.S.A.

Review Editor

Prof. Dr GERHARD HABERMEHL, Dept of Chemistry, School of Veterinary Medicine, Bischofsholer Damm 15, 3000 Hannover 1, Federal Republic of Germany

Editorial Council

K. ANGELIDES, *Houston*
B. E. C. BANKS, *London*
A. L. BIEBER, *Tempe*
J. W. BURNETT, *Baltimore*
W. W. CARMICHAEL, *Dayton*
E. CONDREA, *Tel-Aviv*
F. DAJAS, *Montevideo*
J. W. DALY, *Bethesda*
J. O. DOLLY, *London*
M. F. EL-ASMAR, *Cairo*
J. E. FLETCHER, *Philadelphia*
L. FREIRE-MAIA, *Belo Horizonte*
P. GOPALAKRISHNAKONE, *Singapore*
E. GRISHIN, *Moscow*
F. GUBENSEK, *Ljubljana*
J. M. GUTIÉRREZ, *San José*
E. HABERMANN, *Giessen*
J. B. HARRIS, *Newcastle-upon-Tyne*
R. C. HIDER, *London*
R. J. HUXTABLE, *Tucson*
H. IKEZAWA, *Nagoya*
M. ISMAIL, *Riyadh*
C. Y. KAO, *New York*
E. KARLSSON, *Uppsala*
W. R. KEM, *Gainesville*
E. KOCHVA, *Tel-Aviv*
F. KORNALÍK, *Prague*
M. LAZDUNSKI, *Nice*
F. S. MARKLAND JR, *Los Angeles*
D. MEBS, *Frankfurt*
A. MÉNEZ, *Gif-sur-Yvette*
J. L. MIDDLEBROOK, *Frederick*
S. A. MINTON JR, *Indianapolis*
R. S. NORTON, *Parkville*
S. OLSNES, *Oslo*
C. L. OWNBY, *Stillwater*
T. PIEK, *Amsterdam*
L. D. POSSANI, *Cuernavaca*
P. ROSENBERG, *Storrs*
F. E. RUSSELL, *Tucson*
W. T. SHIER, *Minneapolis*
K. STOCKER, *Basel*
G. R. STRICHARTZ, *Boston*
P. N. STRONG, *London*
R. D. G. THEAKSTON, *Liverpool*
D. A. WARRELL, *Oxford*

International Society on Toxinology

President: Prof. Dr G. HABERMEHL, Dept of Chemistry, School of Veterinary Medicine, Bischofsholer Damm 15, 3000 Hannover 1, Federal Republic of Germany.

Secretary-Treasurer: Dr D. MEBS, Zentrum der Rechtsmedizin, Kennedyallee 104, 6000 Frankfurt am Main 70, Federal Republic of Germany.

The purpose of this society is to advance knowledge on the properties of toxins and antitoxins and to bring together scholars interested in these substances through a common society. Membership consists of those who have conducted and published meritorious original investigations in toxinology, while persons who do not qualify for membership but are interested in the field of toxinology are eligible for associate membership.

Further information concerning the Society and applications for membership may be obtained from the Secretary-Treasurer.

Publishing and Advertising Offices

Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, U.K.,
Tel. (01865) 843000, Fax. (01865) 843010;
Elsevier Science Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A.

Production Editor (Elsevier Science Ltd): Charlotte Harding

Subscription Rates

Annual Institutional Subscription Rates 1995: North, Central and South America U.S.$962; Rest of World £645. Sterling prices exclude VAT. Non-VAT registered customers in the European Community will be charged the appropriate VAT in addition to the price listed. Prices include postage and insurance, and are subject to change without notice.

Members of the International Society of Toxinology may order personal subscriptions at a concessional rate and details of these rates are available on request. Subscription enquiries from customers in North America should be sent to: Elsevier Science Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A., and for the remainder of the world to: Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, U.K., Tel. (01865) 843000, Fax. (01865) 843010.

Back Issues of all previously published volumes, both in hard copy and on microform, are available direct from Elsevier Science offices (Oxford, New York).

Published monthly

Second Class Postage Paid at Newark, NJ. Postmaster send address corrections to Toxicon, Elsevier Science Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A.

Copyright © 1994, Elsevier Science Ltd

LIST OF CONTENTS
1994

Vol. 32, No. 1

1 Instructions for Contributors to *Toxicon*

J. VETTER — 11 *Review Article*—Data on arsenic and cadmium contents of some common mushrooms

Y. ZUROVSKY, Z. ELIGAL, S. GROSSMAN, M. BERGMAN and U. GAFTER — 17 Glycerol-induced augmentation of sensitivity to endotoxin in rats

A. L. BALTCH, R. P. SMITH, M. FRANKE, W. RITZ, P. MICHELSEN, L. BOPP and F. LUTZ — 27 *Pseudomonas aeruginosa* cytotoxin as a pathogenicity factor in a systemic infection of leukopenic mice

W. FLACHSENBERGER and P. MIRTSCHIN — 35 Anticholinesterases as antidotes to envenomation of rats by the death adder (*Acanthophis antarcticus*)

B. LOMONTE, J. LUNDGREN, B. JOHANSSON and U. BAGGE — 41 The dynamics of local tissue damage induced by *Bothrops asper* snake venom and myotoxin II on the mouse cremaster muscle: an intravital and electron microscopic study

J. F. LAWRENCE, M. MAHER and W. WATSON-WRIGHT — 57 Effect of cooking on the concentration of toxins associated with paralytic shellfish poison in lobster hepatopancreas

M. NARAT, P. MAČEK, V. KOTNIK and B. SEDMAK — 65 The humoral and cellular immune response to a lipid attenuated pore-forming toxin from the sea anemone *Actinia equina* L.

K-I. HARADA, I. OHTANI, K. IWAMOTO, M. SUZUKI, M. F. WATANABE, M. WATANABE and K. TERAO — 73 Isolation of cylindrospermopsin from a cyanobacterium *Umezakia natans* and its screening method

N. V. KORSZNIAK and D. F. STORY — 85 Effects of the venom of the Theridiid spider, *Steatoda capensis* Hann, on autonomic transmission in rat isolated atria and caudal artery

S. PUKRITTAYAKAMEE, R. CLEMENS, A. NONTPRASERT, V. DESAKORN, P. CHAROENLARP, T. CHONGSUPHAJAISIDDHI and N. J. WHITE — 97 Antithrombin III and antivenom reversal of coagulopathy in rats envenomated with Malayan pit viper venom

M. MACÍAS-SILVA and J. A. GARCÍA-SÁINZ — 105 Inhibition of hormone-stimulated inositol phosphate production and disruption of cytoskeletal structure. Effects of okadaic acid, microcystin, chlorpromazine, W7 and nystatin

K. C. BARBARO, V. R. D. EICKSTEDT and I. MOTA — 113 Antigenic cross-reactivity of venoms from medically important *Loxosceles* (*Araneae*) species in Brazil

V. GAETE, E. CANELO, N. LAGOS and F. ZAMBRANO — 121 Inhibitory effects of *Microcystis aeruginosa* toxin on ion pumps of the gill of freshwater fish

Short Communications

M. J. H. M. WOLFHAGEN, R. TORENSMA, A. C. FLUIT, C. J. M. AARSMAN, M. JANSZE and J. VERHOEF — 129 Multivalent binding of toxin A from *Clostridium difficile* to carbohydrate receptors

R. Luukkainen, M. Namikoshi, K. Sivonen, K. L. Rinehart and S. I. Niemelä — 133 — Isolation and identification of 12 microcystins from four strains and two bloom samples of *Microcystis* spp.: structure of a new hepatotoxin

Bibliography of Toxinology — 141

International Society on Toxinology—Membership Application — i

Vol. 32, No. 2

G. G. Habermehl — 143 — *Review Article*—Poisonous plants of Brazil

A. Al-Joufi and G. S. Bailey — 157 — Purification by HPLC anion-exchange chromatography and some properties of a kinin-releasing enzyme from the venom of *Agkistrodon halys ussuriensis*

K. O. Long-Rowe and J. W. Burnett — 165 — Characteristics of hyaluronidase and hemolytic activity in fishing tentacle nematocyst venom of *Chrysaora quinquecirrha*

O. Arakawa, T. Noguchi, Y. Shida and Y. Onoue — 175 — Occurrence of carbamoyl-*N*-hydroxy derivatives of saxitoxin and neosaxitoxin in a xanthid crab *Zosimus aeneus*

S. Rawat, G. Laing, D. C. Smith, D. Theakston and J. Landon — 185 — A new antivenom to treat eastern coral snake (*Micrurus fulvius fulvius*) envenoming

R. Wang, P. Moreau, A. Deschamps, J. de Champlain, R. Sauvé, S. Foucart, L. Bai and X.-R. Lu — 191 — Cardiovascular effects of *Buthus martensii* (Karsch) scorpion venom

M. C. E. Gwee, L. S. Cheah, P. Gopalakrishnakone and P. T.-H. Wong — 201 — Prejunctional action of the venom from the Indian red scorpion *Mesobuthus tamulus* on adrenergic transmission *in vitro*

C. F. S. Amaral, M. B. Dias, D. Campolina, F. A. Proietti and N. A. de Rezende — 211 — Children with adrenergic manifestations of envenomation after *Tityus serrulatus* scorpion sting are protected from early anaphylactic antivenom reactions

E. C. T. Landucci, A. Condino-Neto, A. C. Perez, S. Hyslop, A. P. Corrado, J. C. Novello, S. Marangoni, B. Oliveira, E. Antunes and G. de Nucci — 217 — Crotoxin induces aggregation of human washed platelets

Short Communications

A. Acosta, E. D. Rael, N. L. Maddux and C. S. Lieb — 227 — Detection of alkaline phosphatase in venom by blotting methods

I. B. Queiroz, R. M. M. Turchetti-Maia, T. Moraes-Santos and M. V. Gomez — 232 — Ageing and acetylcholine release by tityustoxin from brain cortical slices

International Society on Toxinology—Membership Application — i

Vol. 32, No. 3

Abstracts — 235 — Fourth International Symposium on Neurotoxins in Neurobiology

A. L. Harvey, A. Barfaraz, E. Thomson, A. Faiz, S. Preston and J. B. Harris — 257 — Screening of snake venoms for neurotoxic and myotoxic effects using simple *in vitro* preparations from rodents and chicks

A. Barfaraz and A. L. Harvey	267	The use of the chick biventer cervicis preparation to assess the protective activity of six international reference antivenoms on the neuromuscular effects of snake venoms *in vitro*
M. L. Yudkowsky, J. Beech and J. E. Fletcher	273	Myotoxin *a* reduces the threshold for calcium-induced calcium release in skeletal muscle
J. W. Daly, F. Gusovsky, C. W. Myers, M. Yotsu-Yamashita and T. Yasumoto	279	First occurrence of tetrodotoxin in a dendrobatid frog (*Colostethus inguinalis*), with further reports for the bufonid genus *Atelopus*
L. Kuhn-Nentwig, J. Schaller and W. Nentwig	287	Purification of toxic peptides and the amino acid sequence of CSTX-1 from the multicomponent venom of *Cupiennius salei* (Araneae: Ctenidae)
S. Z. J. Chen, P. Gopalakrishnakone and M. C. E. Gwee	303	Pharmacological effects and pathological changes induced by the venom of *Pseudechis australis* in isolated skeletal muscle preparations
D. S. Smith and D. D. Kitts	317	Development of a monoclonal-based enzyme-linked immunoassay for saxitoxin-induced protein
K. Lala and P. Narayanan	325	Purification, N-terminal sequence and structural characterization of a toxic protein from the Indian scorpion venom *Buthus tamulus*
R. E. Honkanen, B. A. Codispoti, K. Tse and A. L. Boynton	339	Characterization of natural toxins with inhibitory activity against serine/threonine protein phosphatases
G. Rojas, J. M. Jiménez and J. M. Gutiérrez	351	Caprylic acid fractionation of hyperimmune horse plasma: description of a simple procedure for antivenom production
Short Communications		
T. Omori-Satoh, Y. Nagaoka, Y. Yamakawa and D. Mebs	365	Inhibition of hemorrhagic activities of various snake venoms by purified antihemorrhagic factor obtained from Japanese Habu snake
M. Bruno, D. Attard Barbini, E. Pierdominici, A. P. Serse and A. Ioppolo	369	Anatoxin-a and a previously unknown toxin in *Anabaena planctonica* from blooms found in Lake Mulargia (Italy)
Reviews	375	
Bibliography of Toxinology	379	
International Society on Toxinology—Membership Application	i	

Vol. 32, No. 4

Abstracts	381	Eleventh Meeting of the European Section of the International Society on Toxinology
G. G. Habermehl	411	*Historical Review*—Francesco Redi—life and work
C. F. P. Teixeira, Y. Cury, S. Oga and S. Jancar	419	Hyperalgesia induced by *Bothrops jararaca* venom in rats: role of eicosanoids and platelet activating factor (PAF)
L. Sjostrom, I. H. Al-Abdulla, S. Rawat, D. C. Smith and J. Landon	427	A comparison of ovine and equine antivenoms
J. L. Middlebrook and D. L. Leatherman	435	Effects of steroids on association of T-2 toxin with mammalian cells
A. C. S. Barros, D. P. Fernandes, L. C. de L. Ferreira and M. C. Dos Santos	445	Local effects induced by venoms from five species of genus *Micrurus* sp. (coral snakes)

V. Williams, J. White and P. J. Mirtschin 453 Comparative study on the procoagulant from the venom of Australian brown snakes (Elapidae; *Pseudonaja* spp.)

F. Lambein, R. Haque, J. K. Khan, N. Kebede and Y.-H. Kuo 461 From soil to brain: zinc deficiency increases the neurotoxicity of *Lathyrus sativus* and may affect the susceptibility for the motorneurone disease neurolathyrism

K. O. Long-Rowe and J. W. Burnett 467 Sea nettle (*Chrysaora quinquecirrha*) lethal factor: purification by recycling on *m*-aminophenyl boronic acid acrylic beads

A. N. Ramírez, B. M. Martin, G. B. Gurrola and L. D. Possani 479 Isolation and characterization of a novel toxin from the venom of the scorpion *Centruroides limpidus limpidus* Karsch

P. Waring, N. Newcombe, M. Edel, Q. H. Lin, H. Jiang, A. Sjaarda, T. Piva and A. Mullbacher 491 Cellular uptake and release of the immunomodulating fungal toxin gliotoxin

Short Communications

B. Lomonte, J. M. Gutiérrez, G. Borkow, M. Ovadia, A. Tarkowski and L. Å. Hanson 505 Activity of hemorrhagic metalloproteinase BaH-1 and myotoxin II from *Bothrops asper* snake venom on capillary endothelial cells *in vitro*

R. Frew, M. G. Hamilton and P. M. Lundy 511 Identification of noradrenaline in venom from the funnel-web spider *Hololena curta*

Bibliography of Toxinology 517

Erratum 519

International Society on Toxinology—Membership Application i

Vol. 32, No. 5

Report and Abstracts 521 Third Asia–Pacific Congress on Animal, Plant and Microbial Toxins

D. J. de Vries, R. D. McCauley and F. Walker 553 Identification of marine organism extracts active at the EGF binding site of human A431 cells

P. Sunthornandh and K. Ratanabanangkoon 561 A comparative study of three vehicles on antibody responses against elapid snake neurotoxin immunogens

K. S. Y. Low, M. C. E. Gwee, R. Yuen, P. Gopalakrishnakone and H. E. Khoo 573 Stonustoxin: effects on neuromuscular function *in vitro* and *in vivo*

M. Tanigawa, M. Maruyama, M. Sugiki, K. Shimaya, K. Anai and H. Mihara 583 Clearance and distribution of a haemorrhagic factor purified from *Bothrops jararaca* venom in mice

P. A. Melo, M. C. do Nascimento, W. B. Mors and G. Suarez-Kurtz 595 Inhibition of the myotoxic and hemorrhagic activities of crotalid venoms by *Eclipta prostrata* (Asteraceae) extracts and constituents

J.-R. Lin and F. S. Chu 605 *In vitro* neutralization of the inhibitory effect of microcystin-LR to protein phosphatase 2A by antibody against the toxin

Y. Zhang, W-h. Lee, Y-l. Xiong, W-y. Wang and S-w. Zu 615 Characterization of OhS1, an arginine/lysine amidase from the venom of king cobra (*Ophiophagus hannah*)

Short Communications

P. B. Usmanov and F. A. Nuritova 625 The anticoagulant action of phospholipase A from *Eresus niger* spider venom

H-O. TAMURA, M. NOTO, K. KINOSHITA, S. OHKUMA and H. IKEZAWA 629 Inhibition of NGF-induced neurite outgrowth of PC12 cells by *Bacillus cereus* sphingomyelinase, a bacterial hemolysin

Bibliography of Toxinology 635

International Society on Toxinology—Membership Application i

Vol. 32, No. 6

P. PROKSCH 639 *Review Article*—Defensive roles for secondary metabolites from marine sponges and sponge-feeding nudibranchs

J. W. DALY, S. I. SECUNDA, H. M. GARRAFFO, T. F. SPANDE, A. WISNIESKI and J. F. COVER JR 657 An uptake system for dietary alkaloids in poison frogs (Dendrobatidae)

V. T. GOWDA, J. SCHMIDT and J. L. MIDDLEBROOK 665 Primary sequence determination of the most basic myonecrotic phospholipase A_2 from the venom of *Vipera russelli*

R. SHINA, R. C. CRAIN, P. ROSENBERG and E. CONDREA 675 Exposure of phosphatidylcholine and phosphatidylinositol in plasma membranes from rat brain synaptosomes treated with phospholipase A_2 toxins (β-bungarotoxin, notexin) and enzymes (*Naja nigricollis*, *Naja naja atra*)

K. C. BARBARO, V. R. D. EICKSTEDT and I. MOTA 687 Adjuvant effect of *Loxosceles gaucho* (South American brown spider) venom

A. ALAPE-GIRÓN, B. GUSTAFSSON, B. LOMONTE, M. THELESTAM and J. M. GUTIÉRREZ 695 Immunochemical characterization of *Micrurus nigrocinctus nigrocinctus* venom with monoclonal and polyclonal antibodies

A. ALAPE-GIRÓN, B. LOMONTE, B. GUSTAFSSON, N. J. DA SILVA and M. THELESTAM 713 Electrophoretic and immunochemical studies of *Micrurus* snake venoms

J. F. MORAIS, M. C. W. DE FREITAS, I. K. YAMAGUCHI, M. C. DOS SANTOS and W. DIAS DA SILVA 725 Snake antivenoms from hyperimmunized horses: comparison of the antivenom activity and biological properties of their whole IgG and $F(ab')_2$ fragments

G. S. SHEPHARD, P. G. THIEL, E. W. SYDENHAM, J. F. ALBERTS and M. E. CAWOOD 735 Distribution and excretion of a single dose of the mycotoxin fumonisin B_1 in a non-human primate

M. T. JORGE, L. A. RIBEIRO, M. L. R. DA SILVA, E. J. U. KUSANO and J. S. DE MENDONÇA 743 Microbiological studies of abscesses complicating *Bothrops* snakebite in humans: a prospective study

Short Communication
A. S. BABU and T. V. GOWDA 749 Dissociation of enzymatic activity from toxic properties of the most basic phospholipase A_2 from *Vipera russelli* snake venom by guanidination of lysine residues

Bibliography of Toxinology 753

International Society on Toxinology—Membership Application i

Vol. 32, No. 7

B. Ho, D. S. A. Yeo and J. L. Ding — 755 A tetrodotoxin neutralizing system in the haemolymph of the horseshoe crab, *Carcinoscorpius rotundicauda*

W. F. Hink, P. W. Pappas and D. C. Jaworski — 763 Partial biochemical characterization of venom from the ant, *Pseudomyrmex triplarinus*

C. Sevcik, A. I. García-Rodriguez, G. D'Suze and A. J. Mijares — 773 Specific blockage of squid axon resting potassium permeability by *Haliclona viridis* (Porifera: Haliclonidae) toxin (HvTX)

W. Huang, L. P. Vernon and J. D. Bell — 789 Enhancement of adenylate cyclase activity in S49 lymphoma cell membranes by the toxin thionin from *Pyrularia pubera*

B. S. Washburn, D. G. Baden, N. J. Gassman and P. J. Walsh — 799 Brevetoxin: tissue distribution and effect on cytochrome P450 enzymes in fish

M. C. Louzao, A. Alfonso, A. M. Botana, X. Goenaga, A. G. Cabado, M. R. Vieytes and L. M. Botana — 807 Effect of lyophilization on the stability of gonyautoxins obtained from contaminated mussels

M. T. Assakura, A. P. Reichl and F. R. Mandelbaum — 819 Isolation and characterization of five fibrin(ogen)olytic enzymes from the venom of *Philodryas olfersii* (green snake)

K. Terao, S. Ohmori, K. Igarashi, I. Ohtani, M. F. Watanabe, K. I. Harada, E. Ito and M. Watanabe — 833 Electron microscopic studies on experimental poisoning in mice induced by cylindrospermopsin isolated from blue–green alga *Umezakia natans*

Short Communications

D. B. Nielsen, J. Dykert, J. E. Rivier and J. M. McIntosh — 845 Isolation of Lys-conopressin-G from the venom of the worm-hunting snail, *Conus imperialis*

N.-H. Tan, S.-K. Choy, K.-M. Chin and G. Ponnudurai — 849 Cross-reactivity of monovalent and polyvalent *Trimeresurus* antivenoms with venoms from various species of *Trimeresurus* (lance-headed pit viper) snake

Announcement — 855 Venomous Snakes: Ecology, Evolution and Snakebite

Announcement — 855 Natural Toxins II

Bibliography of Toxinology — 857

International Society on Toxinology—Membership Application — i

Vol. 32, No. 8

Letter to the Editor
B. Barraviera — 861 Acute-phase response in snakebite

P. Glaziou and A.-M. Legrand — 863 *Review Article*—The epidemiology of ciguatera fish poisoning

R. Fernandez-Gomez, H. Zerrouk, F. Sebti, M. Loyens, A. Benslimane and M. A. Ouaissi — 875 Growth inhibition of *Trypanosoma cruzi* and *Leishmania donovani infantum* by different snake venoms: preliminary identification of proteins from *Cerastes cerastes* venom which interact with the parasites

R. Melinek, K. S. Rein, D. R. Schultz and D. G. Baden — 883 Brevetoxin PbTx-2 immunology: differential epitope recognition by antibodies from two goats

P. C. CHAN, J. MAHLER, J. R. BUCHER, G. S. TRAVLOS and J. B. REID — 891 Toxicity and carcinogenicity of riddelliine following 13 weeks of treatment to rats and mice

H. C. KREBS, W. KEMMERLING and G. HABERMEHL — 909 Qualitative and quantitative determination of fluoroacetic acid in *Arrabidea bilabiata* and *Palicourea marcgravii* by ^{19}F-NMR spectroscopy

A. S. KAMIGUTI, G. D. LAING, G. M. LOWE, M. ZUZEL, D. A. WARRELL and R. D. G. THEAKSTON — 915 Biological properties of the venom of the Papuan black snake (*Pseudechis papuanus*): presence of a phospholipase A_2 platelet inhibitor

D. LALLOO, A. TREVETT, J. BLACK, J. MAPAO, S. NARAQI, D. OWENS, R. HUTTON, R. D. G. THEAKSTON and D. A. WARRELL — 927 Neurotoxicity and haemostatic disturbances in patients envenomed by the Papuan black snake (*Pseudechis papuanus*)

A. GILLISSEN, R. D. G. THEAKSTON, J. BARTH, B. MAY, M. KRIEG and D. A. WARRELL — 937 Neurotoxicity, haemostatic disturbances and haemolytic anaemia after a bite by a Tunisian saw-scaled or carpet viper (*Echis 'pyramidum'*-complex): failure of antivenom treatment

C. L. OWNBY, T. R. COLBERG and Q. LI — 945 Presence of heat-stable hemorrhagic toxins in snake venoms

T. V. GOWDA and J. L. MIDDLEBROOK — 955 Monoclonal antibodies to VRV-PL-VIIIa, a basic multitoxic phospholipase A_2 from *Vipera russelli* venom

J. POSANGI, J. B. HARRIS and M. A. ZAR — 965 Palytoxin-induced transmitter release in the autonomic nervous system of the rat

L. MOREIRA, G. BORKOW, M. OVADIA and J. M. GUTIÉRREZ — 977 Pathological changes induced by BaH1, a hemorrhagic proteinase isolated from *Bothrops asper* (Terciopelo) snake venom, on mouse capillary blood vessels

A. K. NISHIKAWA, C. P. CARICATI, M. L. S. R. LIMA, M. C. DOS SANTOS, T. L. KIPNIS, V. R. D. EICKSTEDT, I. KNYSAK, M. H. DA SILVA, H. G. HIGASHI and W. DIAS DA SILVA — 989 Antigenic cross-reactivity among the venoms from several species of Brazilian scorpions

Short Communication
C. F. S. AMARAL, A. J. A. BARBOSA, V. H. R. LEITE, W. L. TAFURI and N. A. DE REZENDE — 999 Scorpion sting-induced pulmonary oedema: evidence of increased alveolocapillary membrane permeability

Bibliography of Toxinology — 1005

International Society on Toxinology—Membership Application — i

Vol. 32, No. 9

Scorpion Envenoming
A. HARVEY — 1007 Scorpion envenoming: an introduction

L. FREIRE-MAIA, J. A. CAMPOS and C. F. S. AMARAL — 1009 Approaches to the treatment of scorpion envenoming

M. DEHESA-DÁVILA and L. D. POSSANI — 1015 Scorpionism and serotherapy in Mexico

M. Ismail — 1019 The treatment of the scorpion envenoming syndrome: the Saudi experience with serotherapy

M. Gueron and S. Sofer — 1027 The role of the intensivist in the treatment of the cardiovascular manifestations of scorpion envenomation

H. S. Bawaskar and P. H. Bawaskar — 1031 Vasodilators: scorpion envenoming and the heart (an Indian experience)

K. Radha Krishna Murthy and N. K. Hase — 1041 Scorpion envenoming and the role of insulin

Regular Papers

I. S. Sano-Martins, H. W. Fan, S. C. B. Castro, S. C. Tomy, F. O. S. Franca, M. T. Jorge, A. S. Kamiguti, D. A. Warrell, R. D. G. Theakston and BIASG — 1045 Reliability of the simple 20 minute whole blood clotting test (WBCT20) as an indicator of low plasma fibrinogen concentration in patients envenomed by *Bothrops* snakes

Y. Sugita-Konishi, S. Kumagai and T. Mizuochi — 1051 The cytotoxicity of macrocyclic trichothecenes, roridin A and verrucarin A, on murine T-cells is reduced by Ia-negative splenic adherent cells

D. Mebs — 1059 Anemonefish symbiosis: vulnerability and resistance of fish to the toxin of the sea anemone

A. Lôbo de Araújo, F. Radvanyi and C. Bon — 1069 Purification of an acidic phospholipase A_2 from *Bothrops lanceolatus* (fer de lance) venom: molecular and enzymatic properties

I. I. Kaiser, P. R. Griffin, S. D. Aird, S. Hudiburg, J. Shabanowitz, B. Francis, T. R. John, D. F. Hunt and G. V. Odell — 1083 Primary structures of two proteins from the venom of the Mexican red knee tarantula (*Brachypelma smithii*)

D. N. Ledoux, X.-H. Be and B. R. Singh — 1095 Quaternary structure of botulinum and tetanus neurotoxins as probed by chemical cross-linking and native gel electrophoresis

H. Lamthanh, A. Bdolah, C. Creminon, J. Grassi, A. Menez, Z. Wollberg and E. Kochva — 1105 Biological activities of [Thr^2]sarafotoxin-b, a synthetic analogue of sarafotoxin-b

B. J. Smith, S. D. Holladay and B. L. Blaylock — 1115 Hematopoietic alterations after exposure to T-2 mycotoxin

R. Cahan, A. Shainberg, Z. Malik and Y. Nitzan — 1125 Biochemical and morphological changes in rat muscle cultures caused by 28,000 mol. wt toxin of *Bacillus thuringiensis* israelensis

J. Giménez, R. Lomneth and B. R. DasGupta — 1137 *Clostridium butyricum* neurotoxin: partial amino acid sequence of major proteolytic fragments and intracellular activity in PC12 cells

Short Communications

M. S. Madhyastha, R. R. Marquardt and D. Abramson — 1147 Structure–activity relationships and interactions among trichothecene mycotoxins as assessed by yeast bioassay

Yu. N. Utkin, Y. Kobayashi, F. Hucho and V. I. Tsetlin — 1153 Relationship between the binding sites for an α-conotoxin and snake venom neurotoxins in the nicotinic acetylcholine receptor from *Torpedo californica*

Bibliography of Toxinology — 1159

International Society on Toxinology—Membership Application — i

Vol. 32, No. 10

S. A. WEINSTEIN and K. V. KARDONG 1161 *Review Article*—Properties of Duvernoy's secretions from opisthoglyphous and aglyphous colubrid snakes

K. KEMPARAJU, B. N. PRASAD and V. T. GOWDA 1187 Purification of a basic phospholipase A_2 from Indian saw-scaled viper (*Echis carinatus*) venom: characterization of antigenic, catalytic and pharmacological properties

B. J. HOPKINS, W. C. HODGSON and S. K. SUTHERLAND 1197 Pharmacological studies of stonefish (*Synanceja trachynis*) venom

S. M. LUCAS, P. I. DA SILVA JR, R. BERTANI and J. L. C. CARDOSO 1211 Mygalomorph spider bites: a report on 91 cases in the state of São Paulo, Brazil

N. SHIROMA, K. NOGUCHI, T. MATSUZAKI, Y. OJIRI, K. HIRAYAMA and M. SAKANASHI 1217 Haemodynamic and haematologic effects of *Acanthaster planci* venom in dogs

K. STOCKER, H. HAUER, C. MÜLLER and D. A. TRIPLETT 1227 Isolation and characterization of Textarin®, a prothrombin activator from eastern brown snake (*Pseudonaja textilis*) venom

J. PERALES, H. MOUSSATCHÉ, S. MARANGONI, B. OLIVEIRA and G. B. DOMONT 1237 Isolation and partial characterization of an anti-bothropic complex from the serum of South American Didelphidae

K. TSUJI, S. NAITO, F. KONDO, M. F. WATANABE, S. SUZUKI, H. NAKAZAWA, M. SUZUKI, T. SHIMADA and K-I. HARADA 1251 A clean-up method for analysis of trace amounts of microcystins in lake water

Short Communications

D. J. WEST, E. B. ANDREWS, A. R. MCVEAN, D. J. OSBORNE and M. C. THORNDYKE 1261 Isolation of serotonin from the accessory salivary glands of the marine snail *Nucella lapillus*

N.-H. TAN and G. PONNUDURAI 1265 An investigation on the antigenic cross-reactivity of *Calloselasma rhodostoma* (Malayan pit viper) venom hemorrhagin, thrombin-like enzyme and L-amino acid oxidase using enzyme-linked immunosorbent assay

E. L. B. NOVELLI, J. P. S. VALENTE and N. L. RODRIGUES 1270 Toxic effects of water eutrophication on pancreatic, hepatic and osteogenic tissues of rats

D. MEBS, U. KUCH and J. MEIER 1275 Studies on venom and venom apparatus of Fea's viper, *Azemiops feae*

T. OMORI-SATOH, Y. NAGAOKA and D. MEBS 1279 Muscle extract of hedgehog, *Erinaceus europaeus*, inhibits hemorrhagic activity of snake venoms

J. S. M. EBESU, H. NAGAI and Y. HOKAMA 1282 The first reported case of human ciguatera possibly due to a farm-cultured salmon

L. GARZA-OCAÑAS, T. JIANG, D. ACOSTA, O. TORRES-ALANIS, N. WAKSMAN DE TORRES and A. PIÑEYRO-LOPEZ 1287 Comparison of the hepatotoxicity of toxin T-514 of *Karwinskia humboldtiana* and its diastereoisomer in primary liver cell cultures

Bibliography of Toxinology 1293

International Society on Toxinology—Membership Application i

Vol. 32, No. 11

B. J. Hawgood — 1295 *Review Article*—The life and viper of Dr Patrick Russell MD FRS (1727–1805): physician and naturalist

B. Currie — 1305 *Review Article*—Clinical implications of research on the box-jellyfish *Chironex fleckeri*

Q. Li and C. L. Ownby — 1315 Development of an enzyme-linked immunosorbent assay (ELISA) for identification of venoms from snakes in the *Agkistrodon* genus

S. Lloret and J. J. Moreno — 1327 Immunochemical relatedness between secretory phospholipase A_2 and intracellular phospholipase A_2 activity linked with arachidonic acid mobilization in macrophages

V. Čurin-Šerbec, E. Délot, G. Faure, B. Saliou, F. Gubenšek, C. Bon and V. Choumet — 1337 Antipeptide antibodies directed to the C-terminal part of ammodytoxin A react with the PLA_2 subunit of crotoxin and neutralize its pharmacological activity

Z.-Y. Li, T.-F. Yu and E. C.-Y. Lian — 1349 Purification and characterization of L-amino acid oxidase from king cobra (*Ophiophagus hannah*) venom and its effects on human platelet aggregation

B. Lomonte, A. Tarkowski and L. Å. Hanson — 1359 Broad cytolytic specificity of myotoxin II, a lysine-49 phospholipase A_2 of *Bothrops asper* snake venom

M. A. Poli, V. R. Rivera, J. F. Hewetson and G. A. Merrill — 1371 Detection of ricin by colorimetric and chemiluminescence ELISA

R. Draisci, L. Croci, L. Giannetti, L. Cozzi, L. Lucentini, D. De Medici and A. Stacchini — 1379 Comparison of mouse bioassay, HPLC and enzyme immunoassay methods for determining diarrhetic shellfish poisoning toxins in mussels

F. A. Rodriguez, N. Escobales and C. Maldonado — 1385 Brevetoxin-3 (PbTx-3) inhibits oxygen consumption and increases Na^+ content in mouse liver slices through a tetrodotoxin-sensitive pathway

J. S. Huntley and A. C. Hall — 1397 Aspects of the haemolytic reaction induced by Kanagawa haemolysin of *Vibrio parahaemolyticus*

K. Kinjoh, M. Nakamura and T. Kosugi — 1413 Application of a monoclonal antibody to estimate rabbit fibrinopeptide A released by habutobin

Y. Cury, C. F. P. Teixeira and L. S. Sudo — 1425 Edematogenic responses induced by *Bothrops jararaca* venom in rats: role of lymphocytes

D. L. Marshall, H. Vatanpour, A. L. Harvey, P. Boyot, S. Pinkasfeld, Y. Doljansky, F. Bouet and A. Ménez — 1433 Neuromuscular effects of some potassium channel blocking toxins from the venom of the scorpion *Leiurus quinquestriatus hebreus*

O. Jbilo, C. F. Bartels, A. Chatonnet, J.-P. Toutant and O. Lockridge — 1445 Tissue distribution of human acetylcholinesterase and butyrylcholinesterase messenger RNA

Z.-Q. Qi, K. Yonaha, Y. Tomihara and S. Toyama — 1459 Characterization of the antihemorrhagic factors of mongoose (*Herpestes edwardsii*)

Short Communications

M. C. M. Chung, N.-H. Tan and A. Armugam — 1471 The amino acid sequences of two postsynaptic neurotoxins isolated from Malayan cobra (*Naja naja sputatrix*) venom

T. Ahmad, M. Mezna, S. Chettibi and A. J. Lawrence — 1475 Addition-order dependent modulation of the sensitivity of rabbit erythrocyte membrane to bee venom phospholipase A_2 by oleic acid, lysophosphatidyl choline and albumin

Reviews	1481	
Announcement	1483	Fifth Pan American Symposium on Animal, Plant and Microbial Toxins
Announcement	1484	Symposium on Natural Toxins
Bibliography of Toxinology	1485	
International Society on Toxinology—Membership Application	i	

Vol. 32, No. 12

M. Dehesa-Dávila, B. M. Martin, M. Nobile, G. Prestipino and L. D. Possani	1487	Isolation of a toxin from *Centruroides infamatus infamatus* Koch scorpion venom that modifies Na^+ permeability on chick dorsal root ganglion cells
J. An and W. W. Carmichael	1495	Use of a colorimetric protein phosphatase inhibition assay and enzyme linked immunosorbent assay for the study of microcystins and nodularins
T. Nose, Y. Shimohigashi, S. Hattori, H. Kihara and M. Ohno	1509	Purification and characterization of a coagulant enzyme, okinaxobin II, from *Trimeresurus okinavensis* (himehabu snake) venom which releases fibrinopeptides A and B
M. Trikha, S. Schmitmeier and F. S. Markland	1521	Purification and characterization of fibrolase isoforms from venom of individual southern copperhead (*Agkistrodon contortrix contortrix*) snakes
T. Noguchi, T. Matsui, K. Miyazawa, M. Asakawa, N. Iijima, Y. Shida, M. Fuse, Y. Hosaka, C. Kirigaya, K. Watabe, S. Usui and A. Fukagawa	1533	Poisoning by the red alga 'ogonori' (*Gracilaria verrucosa*) on the Nojima Coast, Yokohama, Kanagawa Prefecture, Japan
G. G. Habermehl, H. C. Krebs, P. Rasoanaivo and A. Ramialiharisoa	1539	Severe ciguatera poisoning in Madagascar: a case report
M. A. Matuszek, W. C. Hodgson, R. G. King and S. K. Sutherland	1543	Some enzymic activities of two Australian ant venoms: a jumper ant *Myrmecia pilosula* and a bulldog ant *Myrmecia pyriformis*
M. I. Alam, B. Auddy and A. Gomes	1551	Isolation, purification and partial characterization of viper venom inhibiting factor from the root extract of the Indian medicinal plant sarsaparilla (*Hemidesmus indicus* R.Br.)
M. Fatehi, E. G. Rowan, A. L. Harvey and J. B. Harris	1559	The effects of five phospholipases A_2 from the venom of king brown snake, *Pseudechis australis*, on nerve and muscle
D. F. Hwang, C. A. Cheng and S. S. Jeng	1573	Gonyautoxin-3 as a minor toxin in the gastropod *Niotha clathrata* in Taiwan
V. Schué, G. A. Green, R. Girardot and H. Monteil	1581	*Clostridium sordellii* cytotoxin induces phosphorylation of an 80,000 mol. wt protein in McCoy cultured cells
A. Alfonso, M. C. Louzao, M. R. Vieytes and L. M. Botana	1593	Comparative study of the stability of saxitoxin and neosaxitoxin in acidic solutions and lyophilized samples
M. Ismail, M. A. Abd-Elsalam and M. S. Al-Ahaidib	1599	*Androctonus crassicauda* (Olivier), a dangerous and unduly neglected scorpion—I. Pharmacological and clinical studies

Y. M. Dambisya, T.-L. Lee and P. Gopalakrishnakone	1619	Action of *Calloselasma rhodostoma* (Malayan pit viper) venom on human blood coagulation and fibrinolysis using computerized thromboelastography (CTEG)
T. Ahmad, A. J. Lawrence and G. Moores	1627	High-resolution two-part basic urea gels for analysis of venom phospholipase A_2 isoforms
V. A. C. Dorce and M. R. L. Sandoval	1641	Effects of *Tityus serrulatus* crude venom on the GABAergic and dopaminergic systems of the rat brain
C. Chávez-Olórtegui, S. C. G. Fonseca, D. Campolina, C. F. S. Amaral and C. R. Diniz	1649	ELISA for the detection of toxic antigens in experimental and clinical envenoming by *Tityus serrulatus* scorpion venom
P. G. Sells, R. G. A. Jones, G. D. Laing, D. C. Smith and R. D. G. Theakston	1657	Experimental evaluation of ovine antisera to Thai cobra (*Naja kaouthia*) venom and its α-neurotoxin
Short Communications		
P. G. Sells, R. D. G. Theakston and D. A. Warrell	1667	Development of α-neurotoxin antibodies in patients envenomed by the monocellate Thai cobra (*Naja kaouthia*)
H. Ishida, A. Nozawa, H. Nukaya, K. Tsuji, H. Kaspar, N. Berkett and T. Kosuge	1672	Isolation and structure determination of a new marine neurotoxin from the New Zealand shellfish, *Austrovenus stutchburyi*
G. Margulis, S. Sofer, E. Zalstein, N. Zucker, R. Ilia and M. Gueron	1675	Abnormal coronary perfusion in experimental scorpion envenomation
L.-M. Chi, A. A. Vyas, G. S. Rule and W.-G. Wu	1679	Expression of glutathione *S*-transferase–cardiotoxin fusion protein in *Escherichia coli*
F. J. Ghadessy, K. Jeyaseelan, M. C. M. Chung, H. E. Khoo and R. Yuen	1684	A genomic region encoding stonefish (*Synanceja horrida*) stonustoxin beta-subunit contains an intron
G. Borkow, B. Lomonte, J. M. Gutiérrez and M. Ovadia	1689	Effect of various Viperidae and Crotalidae snake venoms on endothelial cells *in vitro*
Bibliography of Toxinology	1697	
International Society on Toxinology—Membership Application	i	
Volume Contents and Author Index, Volume 32	I	